

## STUDIES ON COMPOSITIONAL ANALYSIS OF COW DUNG/GLASS FIBER REINFORCED WITH POLYESTER HYBRID COMPOSITES

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### ABSTRACT

In this present paper studied compositional analysis of cow dung/Glass fiber reinforced with Polyester Hybrid composites. It was observed that different compositional analysis in treated and untreated hybrid composites by using EDAX. This reveals in untreated composite it consisting C, O, Si, Cl, this results get effect on properties of composite. In treated composite it consisting C, O, Si, Only. This results it shows a spectacular effect on its properties over compare with untreated hybrid composite.

**KEYWORDS:** EDAX, Cow Dung, Glass Fiber, Hybrid Composite

### INTRODUCTION

Natural fiber reinforced polymer composites have many applications as a class of structural materials because of their high strength, light weight, less density, and very low cost [1]. By adding the tow or more fibers to the different types of matrices it will be form hybrid composite. These composites have superior properties while comparing with reinforced single fiber [2]. The usage of multifibers will be benefiting in hybrid systems each fiber into a single composite product [3]. Many of the researches have focused on increase the properties of hybrid composites [4]. It is important the knowledge on the mechanical properties of materials, which helps for design requirements or formation new hybrid materials. The properties of vegetable fibers in composites enhances when adding the synthetic fibers [5]. Many factors determine the final performance of hybrid composites, such as matrix nature, length and shape of the dispersed fiber (isotropic or anisotropic), fiber-matrix interface and vegetable/synthetic fiber ratio. It was observed that containing low glass fiber volume content mechanical properties of pineapple leaf (PALF) and sisal fiber reinforced polyester composites [6]. Tensile, flexural and interlaminar shear properties of jute/glass/polyester composites and in addition, that the dynamic mechanical properties of randomly oriented short banana/ sisal/polyester hybrid composites and concluded that higher compatibility was obtained hybridizing these fibers, leading to higher stress transfer ability [7-9]. Little work explores more results, many of the researchers attempt to find properties of hybrid composites but no one discussed its elemental analysis. This gives scope for investigating failures and merits of materials.

### METHODOLOGY

#### Materials

Cow dung obtained from local sources and some of these fibers were soaked in 5% NaOH solution for 30 min. To remove any fatty material and hemi cellulose, washed thoroughly in distilled water and dried under the sun for one day. The glass chopped stand mat was used in making the hybrid composite percentage. The unsaturated polyester resin

obtained from Sree Composites World.ltd, Secunderabad, A.P, India, Methyl Ethyl Ketone Peroxide as accelerator and Cobalt Naphthenate as catalyst, which are obtained from M/S Bakelite Hylam Hyderabad, A.P, India, were used.

### Preparation of the Composite and Test Specimen

In this present work the composites were prepared by hand lay-up technique. The matrix of unsaturated polyester and monomer of styrene are mixed in the ratio of 100:25 parts by weight respectively. Later cow dung in powder form is mixed thoroughly and then the accelerator of methyl ethyl ketone peroxide 1% by weight and catalyst of cobalt naphthenate of 1% by weight were added to the mixture and mixed thoroughly. The releasing agent of silicon is sprayed to glass mould and the matrix mixture is poured in to the mould. The fiber is added to matrix mixture, which was poured in the glass mould. The excess resign was removed from the mould and glass plate was placed on the top the casting were allowed to cure for 24hrs at room temperature and then casting is placed at a temperature of 70°C for 3 hrs. The composite were released from mould and are cut to prepare test specimens. This specimen was cut into (5×5) cm<sup>2</sup> as per ASTM. By using EDAX these composites compositions should be analyzed in both treated and untreated mode.

## RESULTS AND DISCUSSIONS

### EDAX Analysis on Untreated and Treated Fiber Hybrid Composites

By using EDAX the composites specimens of its composition were analyzed. The analysis of the composites prepared under different conditions is presented in the following paragraphs.

#### Untreated Cow Dung Fiber

EDAX analysis of specimen is shown Figure 1 from this figure it is observed that the presence of compositional elements in specimen was C, O, Si, Cl, which it gives the information there exist the unwanted elements other than C, O, Si. It was identified it consist high peaks of other elements. This results get affect the composites properties due poor interracial bonding in between the fiber and matrix. It is showed in below figure 1

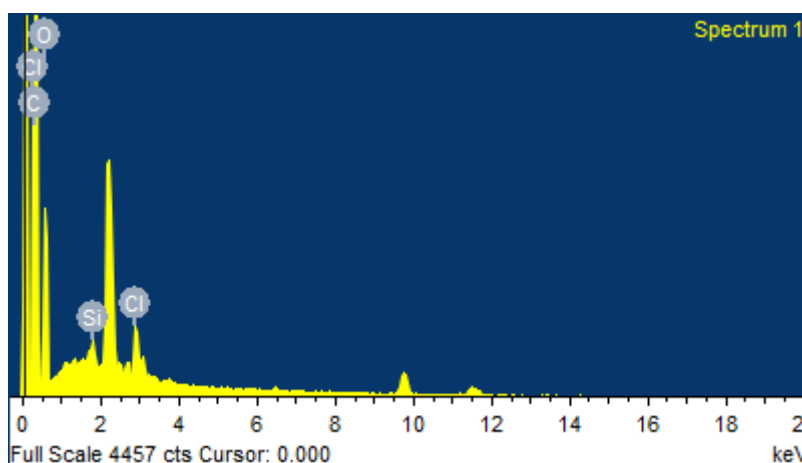
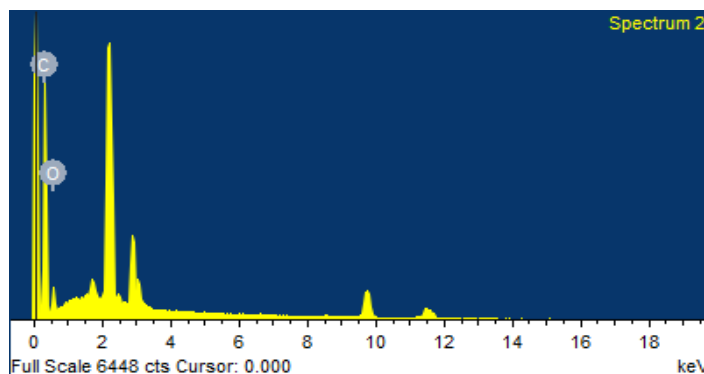


Figure 1: Compositional Analysis in Untreated Cow Dung Fiber Composite

#### Treated Cow Dung Fiber

EDAX analysis of specimen is shown Figure 2 from this figure it is observed that the presence of compositional elements in specimen was C, O, Si, It was identified it consist high peaks for the elements of C, O, Si, for remaining the presence of cow dung fiber it shows saturization with low peaks.

This attempt gives a full information fiber material makes a strong interracial bonding with matrix.



**Figure 2: Compositional Analysis in Treated Cow Dung Fiber Composite**

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## CONCLUSIONS

In this present study it is clearly showed that different compositional analysis in treated and untreated hybrid composites by using EDAX. This reveals in untreated composite it consisting C, O, Si, Al, this results get effect on properties of composite due to poor interfacial bonding with matrix. In treated composite it consisting C, O, Si, Only. This results it shows a spectacular effect on its properties over compare with untreated hybrid composite due strong interfacial bonding.

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